DOCUMENT RESUME

ED 370 529 IR 016 644

TITLE	Microcomputers in Alberta Schools--1993.
INSTITUTION	Alberta Dept. of Education, Edmonton.
REPORT NO	ISBN-0-7732-1167-5
PUB DATE	93
NOTE	26p.; For the 1986 report, see ED 282 540.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Computer Peripherals; *Computer Uses in Education; Educational Technology; Elementary Secondary Education; Foreign Countries; *Microcomputers; School Districts; School Policy; School Surveys; State Surveys; Tables (Data)
IDENTIFIERS	Access to Computers; *Alberta

ABSTRACT

This survey was conducted to provide a picture of how microcomputers were used in Alberta (Canada) schools in 1993. Questionnaires were sent to 125 school jurisdictions, with a return rate of 76%, and 1,524 schools, with a return rate of 87%. Data were collected on total number of computers in use, computer use by brand, expected purchase of computers, peripherals in use, location in the school, access to computers, access to computers beyond class time, administrative uses of computers, teacher uses of computers, subject area uses of computers, other technologies, jurisdiction policies, school policies, and hardware maintenance. (MES)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

IR

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

ED 370 529

Microcomputers in Alberta Schools — 1993

Alberta Education
Edmonton, Alberta

IR016044

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

S. Wolodko

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Alberta Education Cataloguing in Publication

Alberta. Alberta Education.
Microcomputers in Alberta schools — 1993.

ISBN 0-7732-1167-5

1. Microcomputers — Study and teaching — Alberta.
2. Computer managed instruction — Alberta.
3. Computer-assisted instruction — Alberta.
4. Computer input-output equipment — Alberta.
5. Education — Alberta — Data processing.
I. Title.

LB1028.43.A333 1994 371.394'45

Copyright © 1994, the Crown in Right of Alberta, as represented by the Minister of Education. Alberta Education, Policy and Planning Branch, 11160 Jasper Avenue, Edmonton, Alberta T5K 0L2 Canada

Permission is hereby given by the copyright owner for any person to reproduce this publication or any part thereof for educational purposes and on a non-profit basis.

Microcomputers in Alberta Schools 1993

Table of Contents

Page

Overview ii

1. Introduction 1
   - 1.1 Background 1
   - 1.2 The Purpose of the Survey 1

2. The Questionnaires 2
   - 2.1 Design of the Survey 2
   - 2.2 The Response 2

3. Microcomputers in Use 4
   - 3.1 Total Number in Use 4
   - 3.2 Microcomputer Use by Brand 6
   - 3.3 Expected Purchase of Microcomputers 9
   - 3.4 Peripherals in Use 10

4. Microcomputer Utilization 11
   - 4.1 Location in the School 11
   - 4.2 Access to Microcomputers 12
   - 4.3 Access to Microcomputers Beyond Class Times 13
   - 4.4 Administrative Uses of Microcomputers 14
   - 4.5 Teacher Uses of Microcomputers 15
   - 4.6 Subject Area Uses of Microcomputers 16
   - 4.7 Other Technologies 17

5. Policies 18
   - 5.1 Jurisdiction Policies 18
   - 5.2 School Policies 19
   - 5.3 Comparison of Jurisdiction and School Policies 19

6. Hardware Maintenance 20

Overview

Alberta schools began widespread use of microcomputers in the early 1980's. In 1985 and 1986, Alberta Education conducted surveys to gain a measure of how microcomputers were being used in schools of the province. Those studies showed that by 1986, computers were well established as part of the technology used in education.

The survey of *Microcomputers in Alberta Schools – 1993*, was the first since 1986. In January 1993, a questionnaire was developed for jurisdictions and distributed to 125 school jurisdictions. Of these, 95 or 76% were returned.

Subsequently, questionnaires were mailed to 1,524 schools. Of these, 1,319 were completed and returned for a response rate of 87%. The 57 schools reporting no use of computers were removed from the analysis.

Following are the major findings from the 1993 survey:

- As of January 1, 1993, the number of microcomputers in 1,262 Alberta schools totaled 46,336, an increase of 125% in seven years. Forecasts to June 1993 were to add an additional 2,065 computers.

- The ratio of students to microcomputers on January 1, 1986 was 20.3:1. The ratio of students to computers on January 1, 1993 of the 1,262 responding schools was 9.8:1.

- In 1993, the Apple II type of computer was the most common type accounting for 44% of computers. Twenty-seven percent were "PC" or MS-DOS and 22% were Macintosh.

- Again in 1993, the largest proportion of microcomputers (50%) was located in dedicated microcomputer labs. In 1986, the second largest proportion of microcomputers was in business education labs (22%); this location dropped to 10% in 1993. The regular classroom location of microcomputers rose slightly from 13% in 1986 to 16% in 1993.

- Access to computers had increased, although the average for most students was under two and an half hours per week of time directly related to curriculum objectives. Availability of microcomputers was rated as satisfactory or better by 68% of respondents. The classroom teacher was primarily responsible for planning and supervising their use in 74% of responding schools.

- Easy access to computers beyond normal class times rose from 25% in 1986 to 52% in 1993 for students and climbed from 62% to 82% for teachers.

- School administrative tasks performed by microcomputers increased with word processing, spreadsheet and database applications most frequently reported.

- Although the number of microcomputers in Alberta schools increased by 125% since 1986, only 37% of respondents indicated that a specific computer equipped preparation area was available for use by teachers. The level of staff training in the use of computers was rated less than satisfactory by 43% of respondents.

- From elementary to senior high school, major areas of study which use computers included language arts, social studies, mathematics, computer literacy and business education (senior high only).

- New technologies related to computers included electronic bulletin board facilities for communications, voice mail, audio conferencing and video transmission.

- Many jurisdictions and schools had developed policies regarding the use of microcomputers. Issues addressed by policies included copyright of software, acquisition of hardware, and access to computers.

- Maintenance of old and aging microcomputers was a concern for many schools, with 44% indicating that the condition of those in the school was less than satisfactory. Fifty-five percent of maintenance was provided by jurisdiction central services.

- In written comments received from 360 schools, the biggest single concern expressed was funding for computers. Without adequate funds to purchase newer technology or add to existing numbers of computers in the school, it was difficult for microcomputer use to advance. Likewise, as numbers of computers increased and older models required repair, funding was needed for hardware maintenance. Adequate funds for a microcomputer program were seen as vital to all aspects of computer utilization in schools.

- Alberta Education was seen by many teachers as being in a position to help chart the course of computer use in schools particularly in areas such as curriculum design, recommendations regarding technology, development of learning resources, and funding.

1. Introduction

1.1 Background

In the early 1980's, Alberta schools began using microcomputers widely. For over a decade now, computers have been seen as the dominant influence in school technology.

The survey *Microcomputers in Alberta Schools — 1993* is the first such study undertaken in the province since 1986, when a questionnaire was sent to 1,489 schools, of which 1,345 schools or 90% responded. The results of that survey were published by Alberta Education in June 1986 as *Microcomputers in Alberta Schools — 1986*, updating information from a survey sent in 1985 to 1,509 Alberta schools.

The survey in 1986 showed an increase in computers in schools of 39% over 1985. Even then, for most schools the use of computers was still at an early stage.

1.2 The Purpose of the Survey

The purpose of this survey was to provide a picture of how computers were used in Alberta schools in 1993. In addition to noting how many computers and what kind were used in the schools, the survey was intended to provide information on development of policies, projected purchases, maintenance and the types of peripheral equipment used with computer hardware.

The survey also asked for information about the function of computers in many areas. Respondents were asked about the location of computers, school subjects with integrated computer time, tasks performed by software, and how computers were used other than in regular classroom instruction.

2. The Questionnaires

2.1 Design of the Survey

The 1993 survey of microcomputers in Alberta schools was conducted by Alberta Education, as a joint effort of the Alberta Distance Learning Centre (ADLC) and the Policy and Planning Branch. Questionnaires were distributed by the ADLC, where results were tabulated. The Policy and Planning Branch was responsible for the preparation and distribution of this monograph.

In January 1993, two questionnaires were developed by Alberta Education to survey and collect new information about how computers were used. For the first time, a separate two-page questionnaire was sent to 125 school jurisdictions.

A seven-page questionnaire was sent to 1,524 schools. Schools ranged from one-room multi-grade schools to large urban composite high schools.

2.2 The Response

From school jurisdictions, 76% of the questionnaires were completed. The response rate was 87% from schools, with 1,319 questionnaires being completed and returned. Schools and jurisdictions which were slow to reply were contacted to encourage as high a response as possible. In some cases, calls were made to confirm details and to ensure accuracy of reporting.

Results compiled from the returned questionnaires provided information from all levels, ECS to high school. All public and separate schools in Alberta were surveyed. Schools which did not use computers for a variety of reasons had the option of filing a Nil Report. There were 57 such responses. Results presented in this report are based on the 1262 surveys that were completed, unless otherwise noted.

The response from schools with computers represented 455,462 students and 26,203 teachers.

"With fifteen new computers and five new printers, we will make computer literacy a priority as we access the necessary training and plan a continuum of learning from ECS to grade six."

- *Comments* — Respondents had the opportunity to provide written comments, and 360 schools did so. Selected comments, representing opinions expressed, appear in italicized print within quotation marks on some pages. An example is shown at the left. The most frequently occuring comment concerned adequate funding for technology.

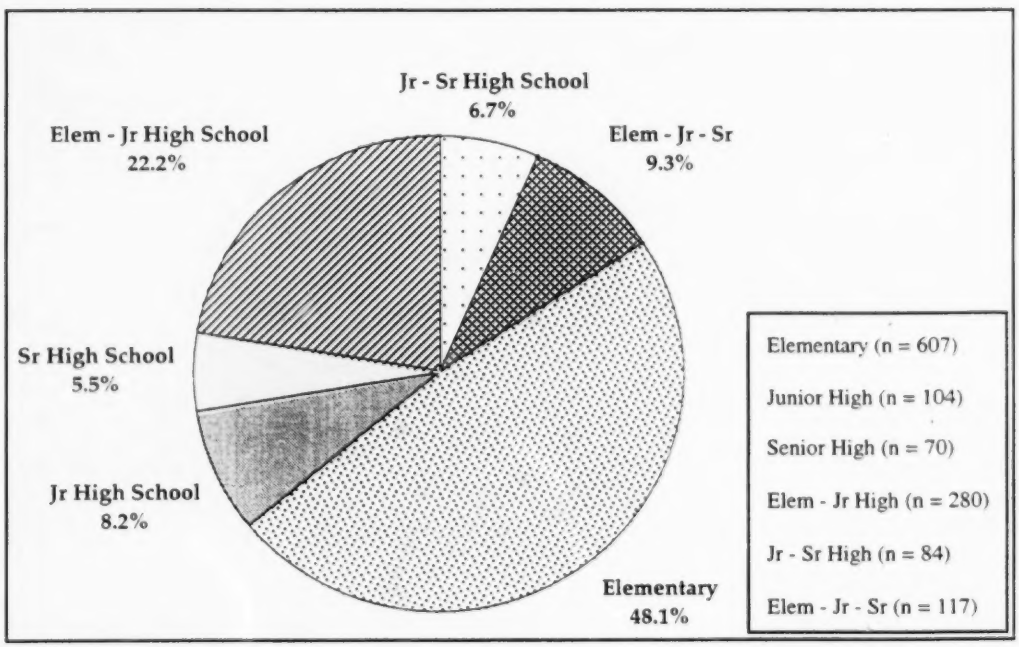
For some aspects of the data analysis, schools were grouped into two categories for comparison:

- *Major Urban* was used to denote schools in the large jurisdictions of Edmonton and Calgary, which account for about 50% of Alberta students; and
- *Other Schools* denoted schools in all other jurisdictions, both rural and those in smaller urban centres.

A total of 500 (40%) surveys were returned from schools in Major Urban jurisdictions. The remaining 762 (60%) came from Other Schools. In total, the responding schools represented 214,597 students in Major Urban schools and 240,865 students from Other Schools.

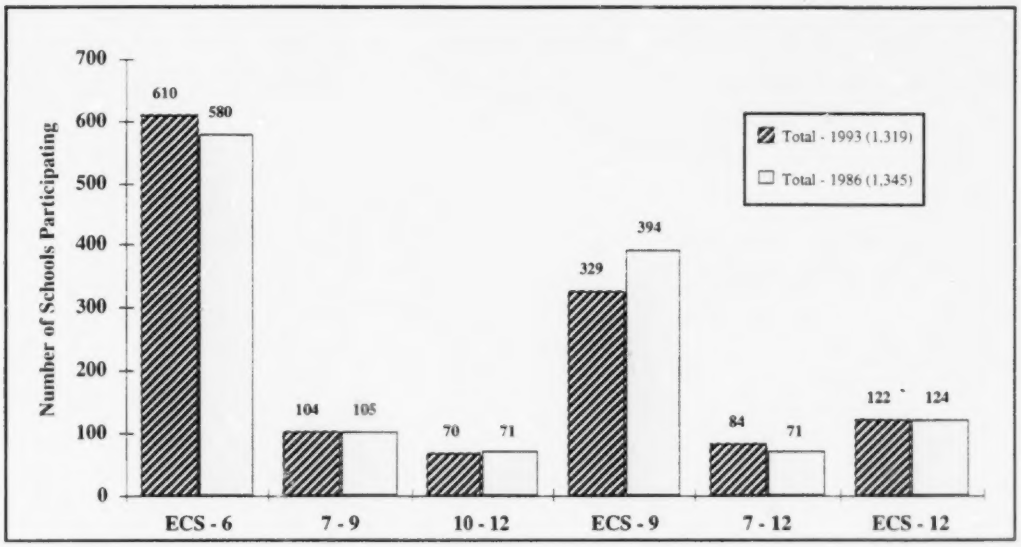
Graph 1 below indicates the response based on the type of school. Elementary schools include ECS to Grade 6. Junior high schools are those with grades 7 to 9. Senior high schools are grades 10 to 12. In many schools, grades from more than one division are included, as indicated in the legend.

Graph 1
Schools Participating in Survey (by category)
(n = 1,262)



Graph 2 compares the grades offered in schools (including those not using computers) in the 1993 survey with those which responded in 1986.

Graph 2
Comparison of Schools Participating in 1993 and 1986
(by Category)



3. Microcomputers in Use

3.1 Total Number In Use

Since 1986, the actual number of microcomputers used in Alberta schools has increased substantially at all levels. Graphs 3 and 4 provide an indication of installations by grade level and type of school.

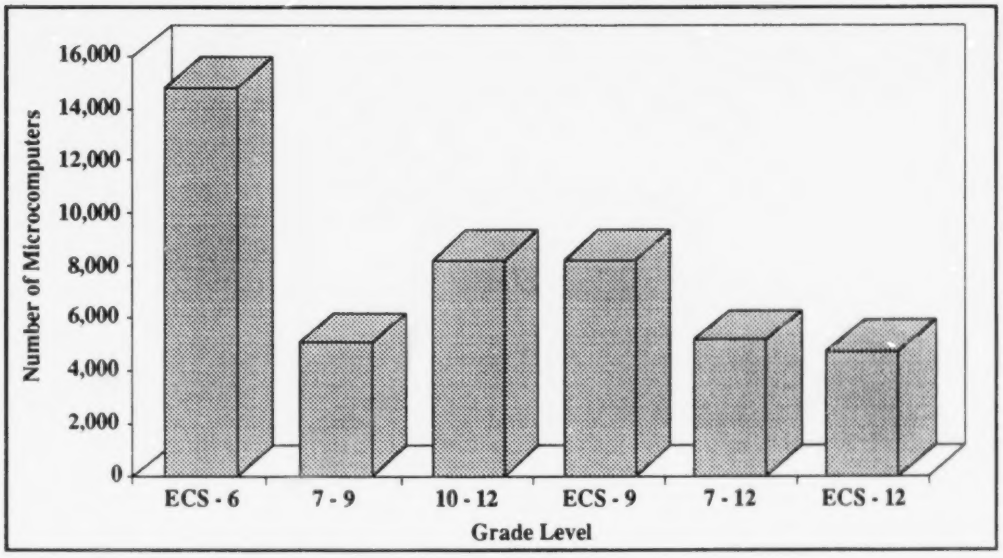
The 1993 survey reported 46,336 microcomputers in 1,262 schools. An additional 2,065 units were expected to be purchased by June, bringing the total to 48,401.

The student to computer ratio in 1993 was 10.6:1 (based on those added in June) compared to 20.3:1 in 1986.

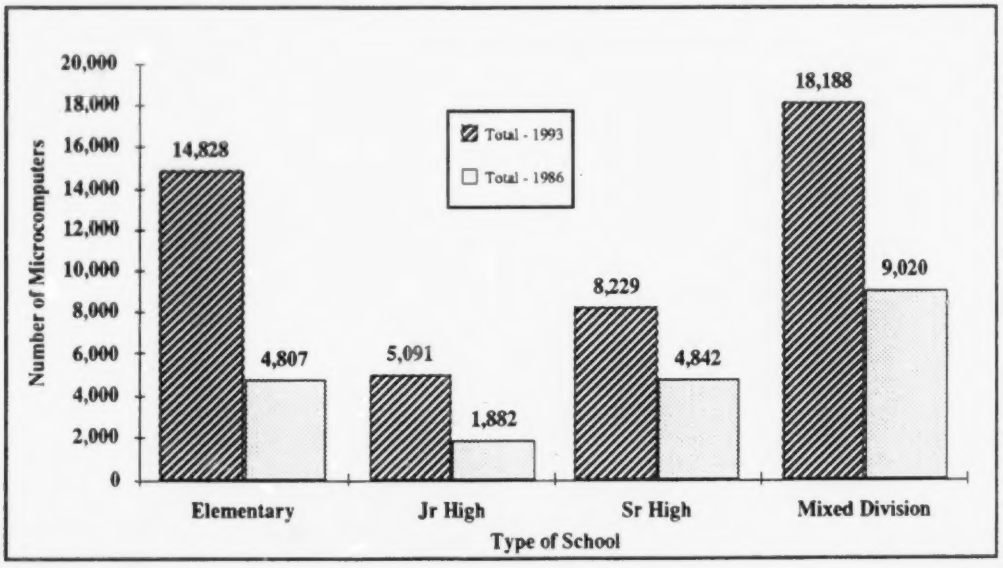
Graph 3 shows proportions of computers used at various school levels.

The total number of microcomputers in Alberta schools has grown dramatically since the 1985 survey. From 1985 to 1986, the number of computers in schools increased by 39%. Since 1986, the number of computers in schools increased by 125% (Graph 4).

Graph 3
Number of Microcomputers at Various School Levels, January, 1993



Graph 4
Comparison of Actual Number of Microcomputers, January, 1993 and 1986



3.2 Microcomputer Use by Brand

"I feel that the staff's use of computers is improving. Computer use is one of our goals this year and we are working towards that. I believe that we will gradually be increasing the number of computers in our school because our Board has made a three-year commitment financially to upgrade and increase the hardware in all schools."

"Our school system has prepared and developed a computer plan and policy related to computer use in its schools. We anticipate that there will be a marked level of increase in use of computers and their availability to staff and students over the next several years."

In the 1993 survey, categories of microcomputers were defined relative to the brand of manufacture:

- *Apple II type* — This includes several models produced by Apple Computer Inc. which were of the Apple II family. Early models, out of production, include the Apple II, the Apple II+ and Apple IIc. The Apple IIe was discontinued later, although it remained in production for some 10 years as it went through various improvements. The more recent Apple II GS was introduced in late 1986 and remained available until 1993.

- *Macintosh with built-in monitor* — Starting in 1984, the introduction of the Macintosh with a built-in monitor remained a standard design format for several models in this series, now the second most popular style in schools.

- *Macintosh with separate monitor* — Beginning with the Macintosh II, this line of computers with a separate monitor in colour or monochrome now comprises a series including the various II models, the LC series, the Centris models and Quadra models of Macintosh. With this style of computer, many schools began moving into computer systems with colour display.

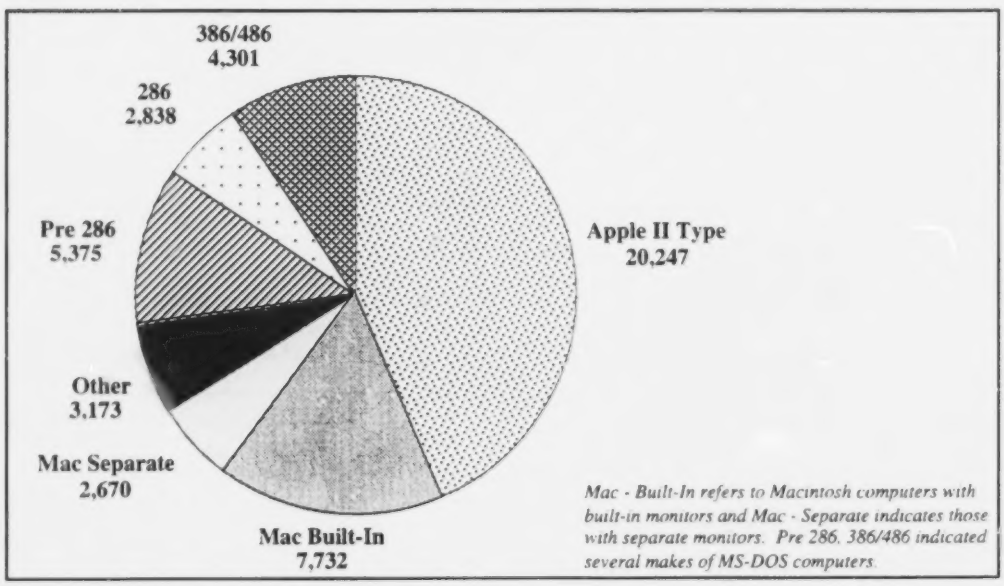
- *MS-DOS computers* — These are manufactured by a number of computer companies and include models by IBM, Compaq, and lesser known "clones" or "compatibles" which use the Microsoft Disk Operating System (MS-DOS). These computers are often referred to as "PC" models, to distinguish them from the Apple or Macintosh brand. In this category, three choices were provided on the survey. These include the "pre-286", the "286" and the "386/486" styles to differentiate among various central processing units used by the computer.

- *Other* — This category was used for any computer not covered by one of the above classifications. Several models are included in this category. They vary from current models to portables, laptops and little-known brands.

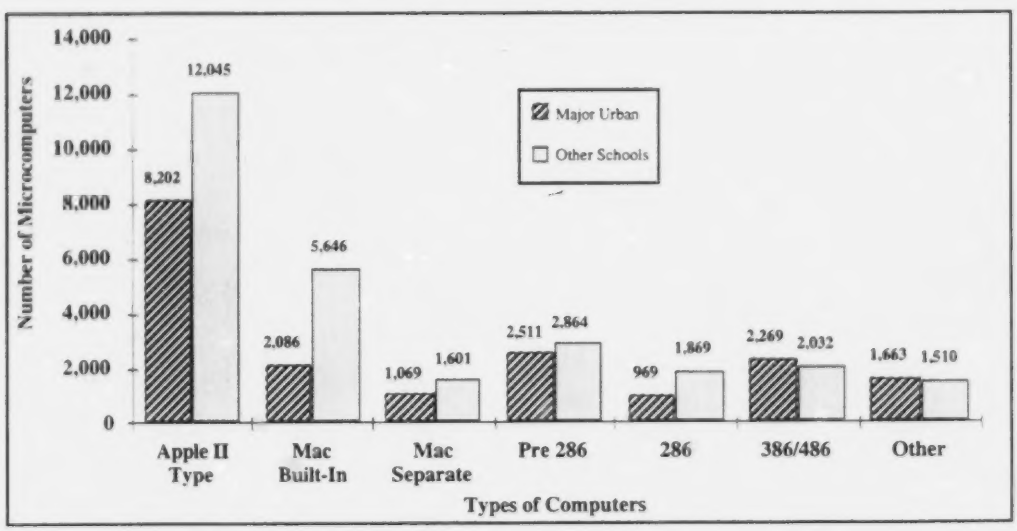
Schools have a choice in the types of microcomputers they use. However, in comments received on the questionnaires, teachers frequently indicated that Alberta Education was in a position to provide assistance in selection, recommendations about technology and support in curriculum and learning resources.

Graphs 5 and 6 indicate the number and type of microcomputers presently in use, and the incidence of various types in major urban and other schools. The Apple II types of computer were most common in Alberta schools, even though they were no longer sold, and account for 44% of computers in use overall. Newer computers have grown in popularity. Macintosh models, which did not exist before 1984, accounted for 22% of the number in schools. The proportion of all "PC" computers stood at 27%, while Other makes represented 7%.

Graph 5
Microcomputers Reported by Manufacturers, 1993
(n = 46,336)



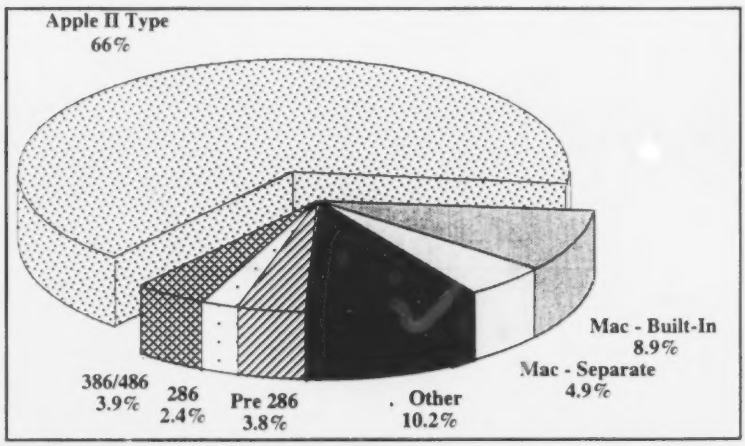
Graph 6
Distribution of Microcomputers in Major Urban and Other Schools, 1993



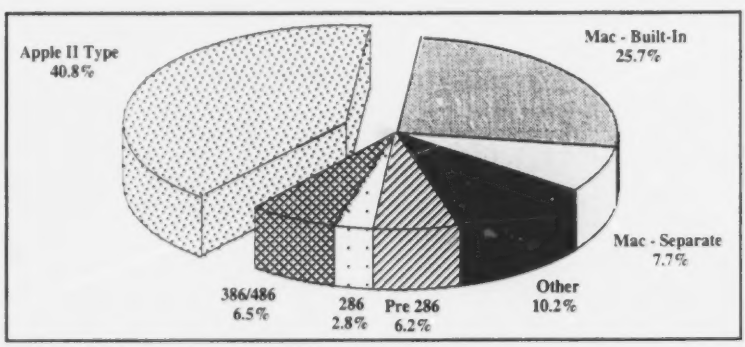
The brands of microcomputer in use at the three school levels were tabulated (Graphs 7, 8 and 9). The Apple II type was most popular in elementary schools. As the grade level increased, other computers became widely used, notably, Macintosh computers and MS-DOS style.

Microcomputers by Brand Category — January, 1993

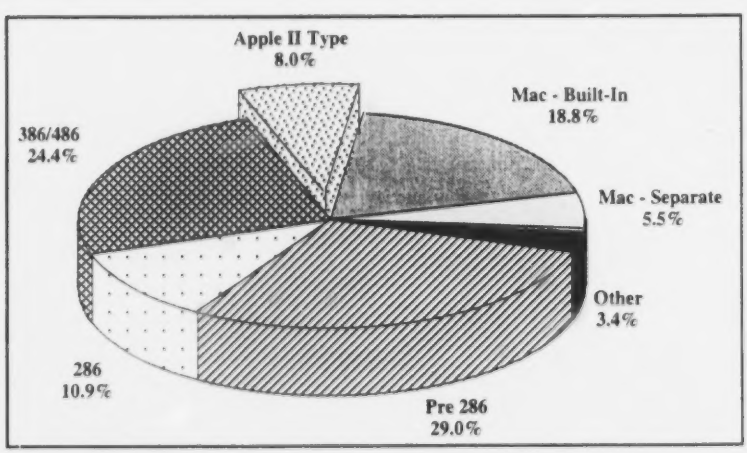
Graph 7
Elementary Schools
(n = 14,828)



Graph 8
Junior High Schools
(n = 5,091)



Graph 9
Senior High Schools
(n = 8,229)



3.3 Expected Purchase of Microcomputers

"Our school is presently working with our Parent Advisory Council to raise money to provide more hardware and software. Our aim is to have a networked lab of 30 computers. In this lab we will eventually have 15 notebook computers that can be taken out of the lab to classrooms or the library. In addition, 15 computers will be put in 'pods' in three areas of the school to increase the availability of computer technology to individuals."

"Due to budgeting limitations of our school and county jurisdiction, a full class set of computers has never been purchased for our microcomputer lab. In addition, some of the Apple IIe computers are ten years old and are reaching the end of their life expectancy. Future replacement and upgrading in the lab will be extremely expensive."

Schools continued to purchase additional computers for a variety of reasons. These included replacing outdated models with newer products, or because of difficulty in servicing older computers. A shift towards colour display was also reflected in additional purchases. In addition, expansion of the computer program within a school necessitated investment in more computers.

While the trend has been to purchase latest models, some used, out-of-production models have occasionally been purchased to add to existing classroom sets of the same model.

The predicted increase in total computers during the 1992-93 school year was 4% (Table 1). Purchase of Apple II computers had diminished to 1% growth. The main areas of growth were Macintosh computers with separate monitors, expected to increase by 19% and MS-DOS 386 and 486 computers, expected to increase by 18%.

Table 1

Total Microcomputers and Expected Purchase

Brand or Type	Total on Jan. 1/93	To be added by June 30/93
Apple II type	20,247	211
Macintosh:		
with built-in monitor	7,732	425
with separate monitor	2,670	508
MS-DOS type:		
with pre-286 processor	5,375	76
with 286 processor	2,838	17
with 386 & 486 processor	4,301	772
Other	3,173	56
TOTAL	**46,336**	**2,065**

3.4 Peripherals in Use

Peripherals are components related to the computer, in addition to the computer system itself. One of the most common peripherals is the computer's printer.

Since the 1986 survey, peripherals have established their place in schools. These include laser printers, high speed modems, Compact Disk — Read Only Memory (CD-ROM) drives and computer display panels for use with overhead projectors. Many of these devices did not exist in 1986.

Table 2 provides specific information on peripherals. Peripherals not in common use, covered by the "Other" category include specialized printers, bar code readers, automatic score card readers, specialized computer displays and tape backup units.

A 25% growth in the number of CD-ROM drives was projected for the 1992-93 school year. Among printers, dot matrix types were expected to increase by less than 2%, compared to 7% for laser printers and 12% for ink jet printers. These trends may reflect lowering costs of laser and ink jet models.

Table 2

Peripherals and Accessories

	Total on Jan. 1/93	To be added by June 30/93
CD-ROM drive	790	190
Dot matrix printer	9,522	170
Laser printer	1,493	101
Ink jet printer	539	65
Modem	1073	50
Network	624	31
Scanner	304	29
Fax modem	246	28
Dedicated modem line	517	19
Videodisc player	124	16
Video digitizer	50	12
Adaptive device for special needs	212	11
Video projection device	233	8
Science lab interface	85	7
Robotic device	78	6
Graphics tablet	79	6
Plotter	88	5
Audio digitizer	35	5
Music synthesizer	168	4
Other	267	17

4. Microcomputer Utilization

4.1 Location in the School

"Our school is in the process of a major renovation/modernization. A major goal of this project was to incorporate systems to increase the use of and availability of technology in the school. All instructional and work areas are now connected by conduit and protected plugs for networking, video and telephone connections. Therefore, as we are able to increase our supply of hardware and software, the school will rapidly adopt technology."

"The integration of computers into all the subjects is currently being addressed. The individual subject teachers are working in conjunction with the computer coordinator to bring the computer technology into the individual classroom."

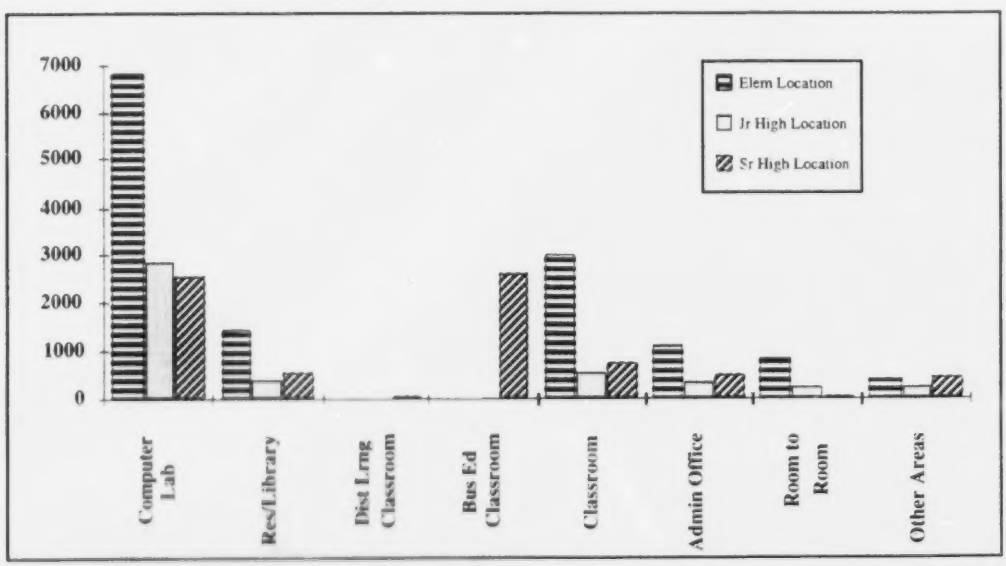
The survey asked respondents to report the locations of computers in the school. The results are presented in Graph 10. The most popular location of microcomputers in 1993 was in a general purpose computer lab (50%). A regular classroom ranked second at 16%, up from 13% in 1986.

One notable change is the use of the business education classroom, which was home to 22% of computers in 1986. By 1993, this figure had dropped to 10% as the use of microcomputers became more diversified throughout the school.

A new location identified in the 1993 survey was the Distance Learning classroom. Distance Learning classrooms were not specifically designated until 1987, when Alberta projects in distance learning began.

"Other Areas" include teachers' work areas, students' union offices, English as a Second Language (ESL), Integrated Occupational Program (IOP), Special Needs, Industrial Arts, Home Economics, Beauty Culture, and Career and Technology Studies.

Graph 10
Major Locations of Microcomputers — January, 1993



4.2 Access to Microcomputers

"At present we have 365 students and 24 computers. Our computer lab setting is necessary to maintain the computers in a workable and manageable program. All classes, grades, students and staff have access to them. The teachers can easily take a class to the lab and write as a class. The class can depend on having the computers and software working during their visit."

"Junior high students are arriving at the high school with more advanced technologies behind them than we can offer here. Students at the high school have no real access to computers for their own use unless they are in Business Education or Visual Communications. Teacher use alone has more than filled our network storage space. School has large numbers of computers, but all are outdated."

"We have a computer lab on wheels. During four periods, grades 5 and 6 are taught computer literacy. The rest of the week, computers are available for teachers to wheel to their rooms."

"The majority of our K-4 teachers plan and supervise the integration of their class computer time. Grade 5-8 classes have formal computer literacy classes supervised by a special computer teacher, and the classroom teachers also supervise some of their own integration."

In recent years, several factors have affected the use of microcomputers in the classroom. The growth in the number of computers has been paralleled by a growth in software products available for the classroom. New curriculum, such as the junior high school program of computer studies, which began implementation in 1990, has also influenced computer utilization and the need for access to computers in schools.

At the same time, some skills have become commonplace. Keyboarding skills which were surveyed in 1986, were not surveyed in 1993 as these skills were considered basic.

Of respondents, 74% considered that the classroom teacher is primarily responsible for planning and supervising the use of computers as part of the classroom experience. About 12% of respondents considered planning and supervision to be primarily functions of a special computer teacher, and 1% considered these tasks to be jobs for the teacher librarian.

The survey showed an increase in the number of computers and access to them. However, the average for most students was under two and a half hours per week of integrated computer time, the time which relates directly to curriculum objectives, (Table 3).

In a separate question, school respondents were asked to rate how satisfactory the availability of microcomputers was in their school. Sixty-eight percent of schools were rated satisfactory or better; 30% were unsatisfactory.

Table 3

Integrated Computer Time Per Week

	Response
No time per week	37
Less than 1 hour per week	518
From 1 - 2.5 hours per week	569
More than 2.5 hours per week	89

4.3 Access to Microcomputers Beyond Class Times

"The most difficult thing for a school to do is keep up with the ever changing society and its use of computers, but I feel that it is important to do the best we can at exposing the staff and students to this technology, as it is becoming more and more a part of our lives."

The 1993 survey indicated a substantial increase in obtaining access to computers beyond normal class times. Easy access for students any time during the school day rose from 25% in 1986 to 52% in 1993. The same figure for teachers climbed from 62% in 1986 to 82% in 1993.

The 1993 survey also showed that 43% of schools made school computers available for home use by teachers on weekends and holidays (Table 4). Although 32% of schools reported that school computers were also available for community use on such occasions as evening classes, many schools stated that this possible service was yet to be requested.

The categories in Table 4 are defined as follows:

- Easy Access — Microcomputers can be used any time during the school day.
- Limited Access — Microcomputers can be used only on specified days and/or during specified hours of the day.
- No Access — Microcomputers can be used only during class time in conjunction with certain specific classes.
- Home Access — Microcomputers can be signed out for use at home on evenings, weekends and holidays.

Table 4

Access to Microcomputers

Beyond Normal Class Times

	Access by	
	Students	**Teachers**
Easy access	659	1029
Limited access	575	232
No access	116	23
Home access	43	541

"All members of our staff are involved in the use of computers with the students. We have completed much of the preliminary work to computerize the library, and money has been set aside for software to be used in the office. Both school councils have set aside money for software they want used as well. We are anxiously awaiting School District direction and policy and are very excited with the recent technology initiatives."

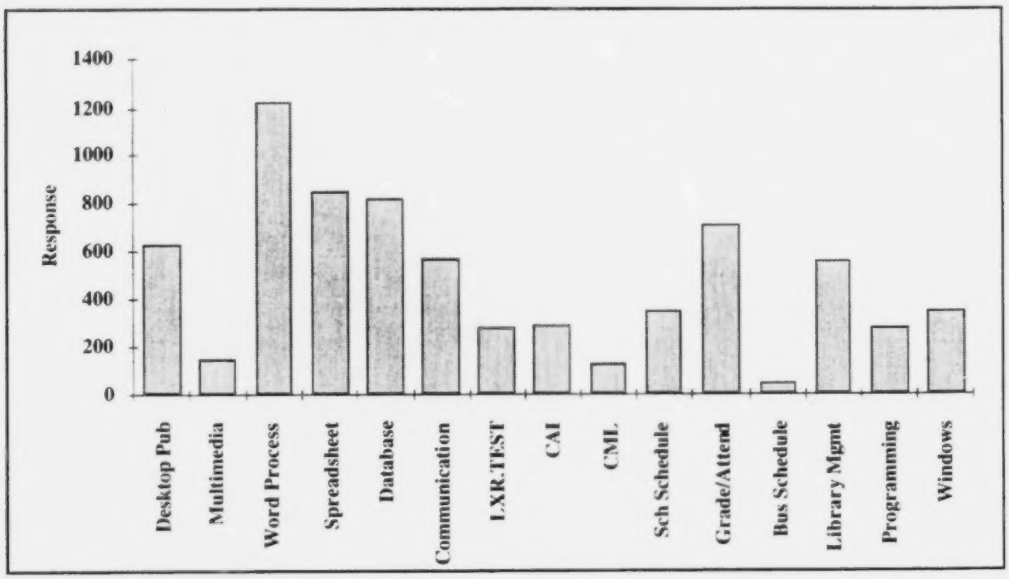
4.4 Administrative Uses of Microcomputers

Several administrative software products now used extensively were not reported in 1986. These include desktop publishing and library management (Graph 11).

Since 1987 Alberta Education has been instrumental in developing programs and materials which have resulted in the use of software in new administrative tasks. These include:

- Computer Managed Learning (CML) — Curriculum approved question banks are produced by Alberta Education for use on MicroVax computers from Digital Equipment Corporation, primarily at distance learning sites.
- Computer Assisted Instruction (CAI) — Alberta Education is developing instructional materials to provide students with learning resources that can be used interactively with computers.
- LXR.TEST — Question banks have also been developed with this software for Macintosh and MS-DOS computers, enabling teachers to build tests from Alberta Education question banks, and to create their own question bank files.
- Education Information Exchange (EIE) — Alberta Education has evaluated and encouraged the installation of student record automation. Standards have been developed for transmission of information, and a province-wide student record database has been developed.

Graph 11
Administrative Applications



4.5 Teacher Uses of Computers

"The integration of computers into all the subjects is currently being addressed. The individual subject teachers are working in conjunction with the computer coordinator to bring computer technology into the individual classroom."

"I believe that it should be mandatory for professional development of computer literacy for all staff, so as to become aware of ways to integrate computers into the curriculum and everyday life."

"It is a priority of the staff to receive training from an expert and with our new policy on school based PD, I feel this priority will be met by all teachers."

Fifty-four percent of respondents indicated that the school had "a mechanism to address the integration of computers and technology into the curriculum." This percentage is low given that the total number of microcomputers in Alberta schools had more than doubled since the 1986 survey.

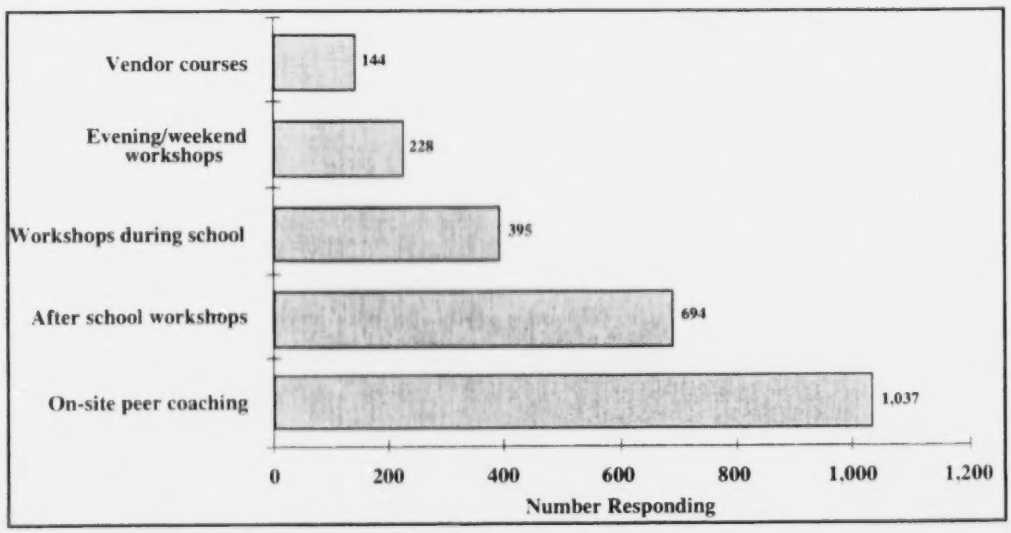
Assistance for teachers with integration of computers into the curriculum was available in a variety of formats. The most frequently reported was on-site peer coaching (Graph 12).

The level of staff training in the use of microcomputers in the school was rated less than satisfactory by 43% of respondents. Forty-six percent rated the current availability of microcomputers to staff and students as less than satisfactory.

Many schools do not yet provide a specific computer equipped preparation area for use by teachers. Only 37% indicated that such a facility is available.

The variety of applications to which microcomputers are put in the school was rated good or excellent by 29%. Another 39% rated the variety of applications satisfactory.

Graph 12
Professional Development



4.6 Subject Area Uses of Microcomputers

"Our program is computer literacy orientated with emphasis on specific computer language and commands. Grade 1 and 2 students learn computer care, safety and equipment, and progress through math, phonics and language learning programs.

"Grade 3 and 4 students are introduced to keyboarding skills and basic word processing skills with significant instructions from the MECC keyboarding program and by our aide. Grade 5 and 6 students do major keyboarding review, significant word processing applications and related business projects.

"We find that many of our students have computers at home and are using their keyboarding skills away from school."

"Right now I have a few math programs for Division I and II, as well as two social studies programs for Division II. We are currently doing all journal writing on computer."

Tables 5 and 6 show how many schools incorporated integrated computer time into various subjects in elementary and junior high school. Three major areas of use were language arts, mathematics and social studies. In elementary schools, a major area of microcomputer use was in computer literacy itself. "Integrated computer time" is time spent on the computer that relates directly to curriculum objectives.

Table 5

Schools Reporting Integrated Computer Time Per Week — Elementary School

	Response
Language Learning	884
Mathematics	803
Computer Literacy	668
Social Studies	503
Science	377
Fine Arts	115
Immersion Programs	70
Health	60
Second Languages	58
Physical Education	6
Other	54

Table 6

Schools Reporting Integrated Computer Time Per Week — Junior High School

	Response
English Language Arts	476
Mathematics	301
Social Studies	255
Science	181
Practical Arts	106
Health & Personal Life Skills	66
Second Languages	57
Immersion Programs	27
Fine Arts	42
Physical Education	5
Other	136

"We have 30 Macs in a lab and 30 Powerbooks. We're hoping to utilize the Powerbooks in the classrooms as soon as our cart is built. We will then use the computers in the language classes (French and English). I have some release time to help teachers integrate computers into their teaching. I also hope to integrate into math and science classes."

In senior high school, a more extensive curriculum resulted in broader use of microcomputers in subject areas, with business education and computer literacy as two major areas of computer use (Table 7). As with elementary and junior high school, there was extensive use of computers in English language arts and mathematics.

Table 7

Integrated Computer Time Per Week

Senior High School

	Response
Business Education	205
Computer Literacy	190
English Language Arts	171
Mathematics	154
Social Studies	88
Distance Education	91
Industrial Education	89
Sciences	85
Personal Development	65
Integrated Occupational Program	59
Social Sciences	33
Fine Arts	32
Second Languages	23
Home Economics	21
Immersion Programs	10
Other	36

4.7 Other Technologies

Several other technologies were used. The most common in the 1993 survey were electronic bulletin board facilities for communication (338), voice mail and telephone answering machines for message systems (276), audio conferencing (105) and video conferencing equipment (26).

Other instructional and communications technologies included overhead projector computer display panels and a variety of video devices. Conventional audiovisual equipment and graphing calculators were also used.

Some specific new applications of computer technologies were Computer Managed Learning and Computer Assisted Instruction, often found in distance learning environments.

5. Policies

5.1 Jurisdiction Policies

"Our system is currently in the process of assessing our computer needs. We will be designing new labs and purchasing new equipment in 1993-94."

"The Division has a committee working on the technological aspects in the school. The committee is currently making recommendations to the Board with regard to areas such as upgrading and use in the schools."

The most prevalent jurisdiction policies and guidelines for microcomputers addressed protection of copyright, community access during out-of-school hours and staff access or permission to borrow equipment outside of school hours (Table 8).

Sixteen jurisdictions reported the ability to move information and data between schools and central office via an electronic network, and 34 jurisdictions had such facilities under development.

Table 8
Jurisdictions Reporting Policies and Guidelines in Place
(n = 95)

	Yes	Under Development
Access to computers...		
To permit community access to computers during out-of-school hours (e.g. Continuing Education, Adult Education)	55	5
To permit staff members to borrow school or jurisdiction equipment to use outside of school hours (e.g. overnight loans, or over-the-summer loan arrangements)	54	4
To facilitate purchase of computer equipment by staff members (i.e. an employee purchase program)	34	9
Technology policy, planning, implementation and standards...		
That reinforce the protection of copyright of computer software	56	11
That feature a planning process for the implementation of computer technology	36	24
To evaluate jurisdiction technology programs	33	24
To promote and fund pilot projects related to technology in jurisdiction schools	30	9
To guide in regular replacement of aging computer equipment	29	20
That establish standards for selection of software & hardware	23	16
Partnerships...		
That encourage partnerships with other jurisdictions/consortia	26	8
That encourage partnerships with private sector organizations	22	17

5.2 School Policies

"At present we are in the process of formulating a plan for upgrading and increasing the effective use of computers in our school."

"We are presently investigating the whole area of technology in our school. Our present technology limits the learning opportunities for our children."

In 1993, the survey asked respondents to report on policies regarding microcomputers in the schools. The majority of schools reported policies for microcomputers related to copyright of software, location of computers and access to them (Table 9). Sixty-nine percent of school respondents rated the quantity and quality of copyright protected computer software in the school as satisfactory or better.

5.3 Comparison of Jurisdiction and School Policies

School policies are usually a reflection of jurisdiction policies. For example, 59% of jurisdictions reported a policy to safeguard the protection of software copyright, while 71% of schools did likewise. For jurisdictions, 31% reported a policy for replacement and acquisition of microcomputers, compared to 42% of schools reporting such a policy.

Of jurisdictions, 58% reported a policy in place regarding community access to computers during out-of-school hours. Sixty-three percent of schools have a policy on access to microcomputers.

Table 9
School Policy on Microcomputers
(n = 1,262)

The school has established policy respecting...

	Yes
Staff training in the use of microcomputers	316
The safeguarding of copyright of computer software	892
The replacement and acquisition of microcomputers	532
The replacement and acquisition of software	592
The location of microcomputers	814
Access to microcomputers	801

6. Hardware Maintenance

"Maintenance and repair will be a problem as the machines get older; the dollars are getting tighter."

"The funds are not available to keep up with technological training and purchasing of computers for our system. Within our system there is an inequitable distribution of funds and software, which in the end disadvantages a number of students simply by virtue of the school they attend."

"The school is in dire need of a major upgrade of computers for pupil use. Our Apple and IBM computers are outdated, software is outdated and repair costs are increasing. There is a great need to update and advance in the area of technology for elementary students. As one school, it is difficult to remain current as directions locally and provincially are unclear and change frequently."

"When budgeting for computers, it is important to plan on maintenance costs and future purchases of software and hardware. Money has been spent on excellent equipment, but money for software and maintenance is limited."

The increased number of microcomputers in schools, including many older models, has resulted in a growing concern over maintenance. As indicated earlier, the Apple II series of computers is the most common "platform" in Alberta schools and the models are no longer in production.

A concern expressed by many respondents was the difficulty of working with outdated equipment that has limited performance capability. Of respondents, only 9% rated age and condition as excellent. In contrast, 44% of schools indicated that the age and condition of computers is less than satisfactory, and 45% are in satisfactory or good condition.

Computer maintenance was performed by someone at the jurisdiction's central facilities in 55% of the schools (Graph 13). Considerable service was also performed in the school, by either a regular teacher or the computer coordinator. For small centres with neither a jurisdiction maintenance service nor a local vendor, computers were frequently shipped to an out-of-town location for repair.

Graph 13
Microcomputer Maintenance